ILLINOIS NATURAL HISTORY SURVEY

FAUNISTIC SURVEYS AND INSECT IDENTIFICATION

URBANA, ILLINOIS

TICKS

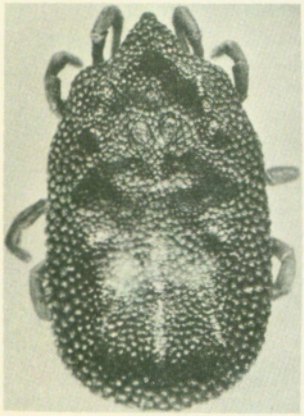
Common names of some species:
wood (or American dog) tick
brown dog tick
lone star tick

Corresponding scientific names:
Dermacentor variabilis
Rhipicephalus sanguineus
Amblyomma americanum

Approximately 800 species of ticks have been described in the world, and more than 40,000 separate scientific articles have been written about them. Such active interest in ticks by scientists stems largely from the fact that ticks are proven vectors of disease-producing organisms, they feed almost exclusively on the blood of terestrial vertebrates, and some few attack man and his domestic animals.

Fifteen species of ticks have been recorded from Illinois. Another half dozen more species eventually may be found, either occasionally from shipments of livestock or from resident species of mammals and birds. Of the common Illinois ticks, three are dangerous because they are proven vectors of diseases often fatal to man, and several more are suspected to be vectors of these and other diseases. Many ticks are long lived (3 to 20 years as adults), longer than most insects, and can carry latent infections and even transmit certain viruses and rickettsias through the egg or sperm to another generation of ticks.

Ticks are large mites (Acarina) belonging principally to two families, briefly characterized as follows:



Ornithodoros kelleyi, Kelly's bat tick, adult female, unengorged. Note leathery, granulated body surface. Photo by W. Zehr.

Argasidae (soft ticks) with about 100 species known.

1. adult body leathery without a differentiated, dorsal, hard shield; mouth parts located on the ventral surface, hidden dorsally.
2. mouth parts not attached firmly to host by cement.
3. feed primarily on birds.
4. act as *lair* parasites, feed on the host intermittently in the nest over a period of many days.
5. lay few (100 or so) eggs at a time over an extended period.
6. life cycle composed of larva (6 legged), 2 nymphal stages (each 8 legged), and adult (8 legged).

The Argasidae is represented in Illinois by *Ornithodoros kelleyi* Cooley and Kohls which occurs commonly on bats, and *Otobius megnini* (Duges) taken once from Jerseyville, in 1954, on a human being. So far *Argas persicus* (Oken), the fowl tick, found on chickens in the southern states, has not yet been collected in Illinois.

Ixodidae (hard ticks) with about 700 species known.

1. adult body partly hardened into a rigid shield (scutum) which covers most of the dorsal surface in the male but only the anterior dorsal surface in the female; mouth parts located anteriorly, fully exposed dorsally.
2. Cement secreted around mouth parts making attachment to host firm.
3. usually feed on terestrial vertebrates, many on mammals, a few on birds; immatures often have different host than do adults.
4. often take up to a week of continuous attachment to feed to engorgement.
5. lay all eggs (up to 2,000 to 8,000) over a short period of time.
6. life cycle composed of larva (6 legged), 1 nymphal stage (8 legged), and adult (8 legged).

The Ixodidae is represented in Illinois by two species which in spring and summer bite man, *Dermacentor variabilis* (Say) and *Amblyomma americanum* (Linnaeus); one species which is host specific to dogs, *Rhipicephalus sanguineus* (Latreille); two rabbit ticks, one of which, *Haemaphysalis leporispalustris* (Packard) transmits tularemia; one cattle tick, *Boophilus annulatas* (Say), now seemingly extirpated from our state; 6 other species belonging to the genus *Ixodes* which infest wild mammals and birds, some of which are known vectors of disease-producing organisms and one of which, *Ixodes scapularis* Say (the black-legged tick), attacks man in autumn; and one other species belonging to the genus *Dermacentor* which occurs in autumn and winter on deer, cattle, and horses.

Dermacentor variabilis (Say)
Wood tick, American dog tick

Dermacentor variabilis, wood tick, adult female, unengorged. Dorsal shield with much silver markings. Photo by W. Clark.

Dermacentor variabilis, wood tick, adult female, engorged. Relative size of dorsal shield and legs indicated degree of expansion of body wall. Photo by W. Clark.

From the human viewpoint, this is the most dangerous tick in Illinois. It is found throughout the state, being most common in the south but locally abundant in the north. Only adults of this tick attack man and his dogs. It can transmit the organism, *Rickettsia rickettsii*, that produces Rocky Mountain spotted fever in man. Cases of this fever in human beings have been reported from every county in Illinois and some deaths have resulted. Two suspected cases of wood tick paralysis, one in a mouse and one in a raccoon, have been observed in our state. Human beings have been similarly paralyzed (death results if the tick is not removed) in other states. The mechanism of tick paralysis is still unknown to science.

Adults of the wood tick come out of winter hibernation early in spring around brushy places and at the edge of woods, especially along animal trails. They reach their peak of activity in May and June. Mating takes place on the host. Females lay from 4,000 to 6,000 or more eggs. Larvae and nymphs can be found also in nests of wild mice and possibly these stages overwinter in hibernation too. By mid-August few adults are present and it is extremely unusual to find one after September.

From our observations, the adult wood tick lies in wait, ready to attach to a passing mammal, for 24 hours of the day during the spring and early summer, except in wet and cool weather. In Illinois adults have been taken from woodchucks, gray and fox squirrels, opossums, coyotes, skunks, raccoons, deer, sheep, cattle, dogs, and human beings. Rabbits, birds, and reptiles are rarely attacked. *Microtus* and *Peromyscus* mice are hosts to the immature stages.

As a precautionary measure, it is advisable to look oneself over for ticks upon returning from each out-of-door excursion. Wood ticks usually wander over clothing and the body for hours before settling down to feed and it is possible to remove them before any harm is done. A favorite place for feeding is at the base of the head at the hairline. If they are found attached with their mouth parts imbedded in the skin, a firm continuous pull will dislodge them.

In recent years tetracycline antibiotics or chloramphenicol have been used effectively to treat tick fever. A physician should be consulted if symptoms of the disease (rashes and fever) are suspected.

Rhipicephalus sanguineus (Latreille)
Brown dog tick

Rhipicephalus sanguineus, brown dog tick, adult female, unengorged. These ticks lack silver markings. Photo by W. Zehr.

Essentially the brown dog tick is a tropical species that is able to survive in Illinois only in heated houses or kennels. Its host is the domestic dog and the strain of dog tick introduced to North America hardly ever bites man. In warm climates this tick is a vector of malignant jaundice of dogs and in the Old World it is said to transmit a mild type of spotted fever from dog to man. Neither disease has been reported in our state.

The brown dog tick will breed throughout the year. Eggs and all stages of unfed ticks are apt to be found hidden in crevices in the floor or behind furniture in places frequented by dogs. Engorging ticks seem to prefer the region behind the head or around the ears of the dog.

For control, Dr. Stevenson Moore III, University of Illinois and Illinois Natural History Survey entomologist, recommends that houses infested with the brown dog tick be treated with residual insecticides such as 2.0% chlordane or 0.5% dieldrin in oil bases applied from pressurized spray cans. Particular attention should be given to floor areas where the dog sleeps. These sprays should not be used if cats are also present. The dog can be safely treated directly either with 4.0% malathion or 5.0% carbanyl (Sevin) dust. Where cats are present these same dusts may be used around the house in lieu of chlordane or dieldrin.

Amblyomma americanum (Linnaeus)
Lone Star Tick

Amblyomma americanum, lone star tick, adult female, unengorged. Note single median silver spot. Photo by W. Zehr.

This is a southern tick which seems to be moving into some of the southern counties of our state. It is abundant in neighboring Kentucky and southern Missouri and for years it has been reported by Illinois residents returning from vacations in the South. In 1965 and 1966, however, Mr. G. G. Montgomery, Wildlife research associate, Illinois Natural History Survey, found naturally occurring specimens of the lone star tick on deer in Pope County and Williamson County.

As far as is known, this tick is not a vector of disease-producing organisms in the Midwest. Even so, the bite of the tick is extremely irritating to human skin, with itching often persisting for weeks after the tick is removed. This tick in all its stages – larvae, nymphs, and adults – will bite human beings.

Lone star ticks are found most frequently along game trails in brushy places or at the edge of woods where they wait on vegetation for a passing animal, bird, or man. Adults and nymphs are most numerous in spring and larvae reach their peak of activity in July and August. Larvae usually wait in clusters and many may be picked up at once.

By contrast to the negative preference of the wood tick, rabbits are a favorite host of the lone star tick.

When in areas infested by the lone star tick, it is advisable to check ones clothing frequently to remove crawling ticks before they have a chance to settle to feed. Wearing of knee-high, smooth rubber boots almost completely reduces the chances of tick attachment while walking, but the discomfort of boots may outweigh the risk of tick encounters. Some of the common mosquito repellants sold in drug stores give limited protection when applied to the parts of clothing likely to brush against vegetation. So far this tick has been too rare in Illinois to be of much importance.

Check list of the ticks of Illinois

Family Argasidae

Ornithodoros kelleyi Cooley and Kohls - on bats
Otobius megnini (Duges)* - usually on large animals

Family Ixodidae

Amblyomma americanus (Linneaus)* - on mammals and ground birds
Boophilus annulatus (Say)* - probably extirpated from Illinois
Dermacentor albipictus (Packard) - on large animals in autumn and winter
Dermacentor variabilis (Say) - on mammals, except rarely rabbits
Haemaphysalis leporispalustris (Packard) - on rabbits and birds
Ixodes beargi Cooley and Kohls* - on cliff swallows
Ixodes cookei Packard - on woodchucks and skunks mostly
Ixodes dentatus Marx - on rabbits and birds
Ixodes muris Bishopp and Smith* - on mice mostly
Ixodes scapularis Say* - on mammals and birds in autumn and winter
Ixodes sculptus Neumann - on ground squirrels
Ixodes texanus Banks - on raccoons in winter
Rhipicephalus sanguineus (Latreille) - on domestic dogs

*not yet commonly found.

Lewis J. Stannard, Taxonomist
1967